Name: _____

1) Set $A = \{(1,2), (2,3), (3,4), (4,5)\}$. If the inverse of the set A is A^{-1}, which statement is true?

A) A is a function and A^{-1} is not a function.

B) A is not a function and A^{-1} is a function.

C) A and A^{-1} are functions.

D) A and A^{-1} are not functions.

2) If $f(x) = 2x + 1$ and $g(x) = \frac{1}{2}(x - 1)$, what does $f(g(-4))$ equal?

A) -4 B) 1 C) $-\frac{1}{4}$ D) 4

3) If $g(x) = x + 3$ and $f(x) = x^2 - 2$, find the value of $g(f(-1))$.

4) If $g(x) = x + 3$ and $f(x) = x^2 - 2$, find the value of $f(g(a + 2))$.

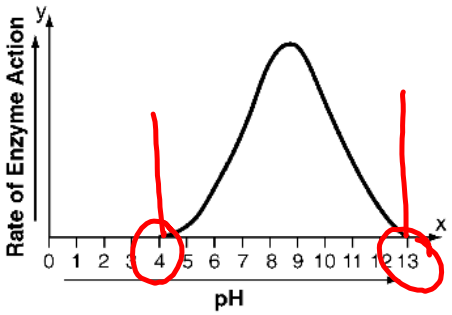
5) The domain of the equation $y = \frac{1}{(x - 1)^2}$ is *all* real numbers

A) less than 1
B) greater than 1
C) except 1 and -1
D) except 1

6) What is the domain of $f(x) = \sqrt{x - 6}$?

A) $\{x \mid x > 6\}$ B) $\{x \mid x \geq 6\}$ C) $\{x \mid x = 6\}$ D) $\{x \mid x \leq 6\}$

7) The effect of pH on the action of a certain enzyme is shown on the accompanying graph.



What is the domain of this function?

A) $\{x \mid 4 \leq x \leq 13\}$
B) $\{x \mid x \geq 0\}$
C) $\{x \mid 4 \leq y \leq 13\}$
D) $\{y \mid y \geq 0\}$

2) $f(x)=2x+1$ $g(x)=\frac{1}{2}(x-1)$

$f(g(-4))=$

$g(-4)=\frac{1}{2}(-4-1)=-\frac{5}{2}$

$f\left(-\frac{5}{2}\right)=2\left(-\frac{5}{2}\right)+1=-4$

A

3) $g(x)=x+3$ $f(x)=x^2-2$ $g(f(-1))$

$f(-1)=(-1)^2-2=-1$

$g(-1)=-1+3=2$

4) $g(x)=x+3$ $f(x)=x^2-2$

$f(g(a+2))$

$g(a+2)=(a+2)+3=a+5$

$f(a+5)=(a+5)^2-2$

$f(a+5)=a^2+10a+25-2$

$f(a+5)=a^2+10a+23$

$(a+5)^2=(a+5)(a+5)$

$=a^2+5a+5a+25$

$=a^2+10a+25$

5) domain of $f(x)=\frac{1}{(x-1)^2}$

$(x-1)^2\neq 0$

$(x-1)\neq 0$

$+1 \quad +1$

$x\neq 1$

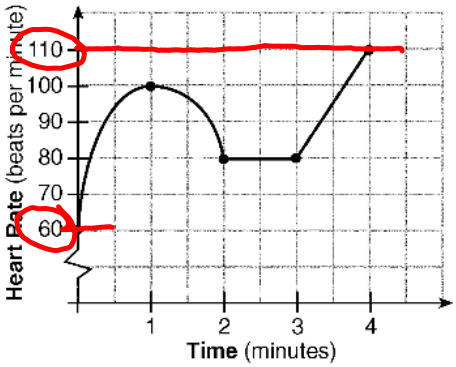
6) $f(x)=\sqrt{x-6}$

$x-6\geq 0$

$+6 \quad +6$

$x\geq 6$

8) The accompanying graph shows the heart rate, in beats per minute, of a jogger during a 4-minute interval.



What is the range of the jogger's heart rate during this interval?

A) 60-110 B) 1-4 C) 0-4 D) 0-110

9) Which equation defines a function whose inverse is *not* a function?

A) $y = -x$ B) $y = 3x + 2$ C) $y = |x|$ D) $y = 2^x$

10) If point (a,b) lies on the graph $y = g(x)$, the graph $y = g^{-1}(x)$ must contain point

A) (b,a) B) $(a,0)$ C) $(0,b)$ D) $(-a,-b)$

11) If the function $y = \sqrt{x}$ is replaced by $x = \sqrt{y}$, then the new graph can be described as a reflection of $y = \sqrt{x}$

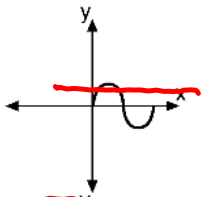
A) in the y-axis
B) in the line $y = \sqrt{x}$
C) in the line $y = x$
D) in the line $y = -x$

12) If function g is the inverse of function f, then what does f(g(-5)) equal?

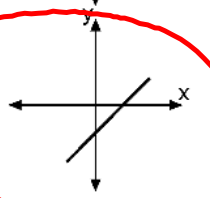
A) $\frac{1}{5}$ B) 5 C) $-\frac{1}{5}$ D) -5

13) Which of the following graphs has an inverse that is a function?

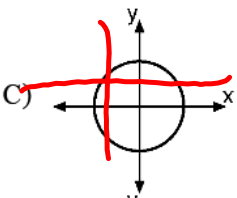
A)



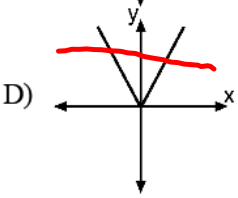
B)



C)



D)



14) What is the inverse of the equation $y = 3x - 2$?

A) $y = \frac{x+2}{3}$ B) $y = x$ C) $y = 2x - 3$ D) $y = 3x + 2$

$x = 3y - 2$, $+2$ $+2$

15) For the given relation(s):

(**a**) State the inverse. $x = y - 2$ or $y = x + 2$

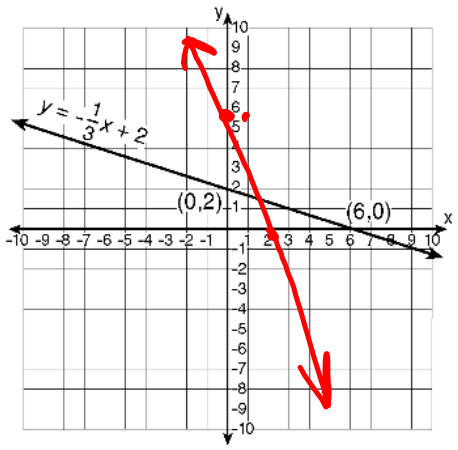
$\frac{x+2}{3} = \frac{3y}{3}$ $y = \frac{x+2}{3}$

(**b**) State whether or not the inverse is a function. [*Justify your answer.*]

$\{(x,y) \mid y = x - 2\}$

$y = x - 2$ is 1 to 1

16) The accompanying diagram shows the graph of the line whose equation is $y = -\frac{1}{3}x + 2$.



(**a**) On the same set of axes, sketch the graph of the inverse of this function. [*Show all work.*]

(**b**) State the coordinates of a point on the inverse function.

(0,6) or (2,0)

17) The expression $(2y)^{\frac{2}{5}}$ is equivalent to

A) $\sqrt{32y^5}$ B) $\sqrt[5]{2y^2}$ C) $\sqrt{2y^5}$ D) $\sqrt[5]{4y^2}$

power root $\sqrt[5]{(2y)^2} = \sqrt[5]{4y^2}$

18) Which equation is equivalent to $y = 10^{-x}$?

A) $y = (\frac{1}{10})^{x}$ B) $y = 10^{-x}$ C) $y = (\frac{1}{10})^{-x}$ D) $y = -10^{-x}$

19) The expression $(a^2)^3$ is equivalent to

A) $2a^5$ B) a^6 C) $3a^2$ D) a^5

20) The expression $(-3x^2y^3)^3$ is equivalent to

A) $-27x^5y^6$ B) $-9x^6y^9$ C) $-27x^6y^9$ D) $-3x^5y^6$

21) When $3x^2$ is multiplied by $6x^4$, the product is

A) $2x^2$ B) $18x^8$ C) $9x^6$ D) $18x^6$

22) Simplify: $(5y)^0$ $= 1$

23) Simplify and express with positive exponents: $(-3x)^{-2}$ $= \frac{1}{(-3x)^2} = \frac{1}{9x^2}$

24) Express with rational exponents: $\sqrt[3]{9}$ $9^{\frac{1}{3}}$

Power Root Fraction

25) Express in radical form: $(2y)^{\frac{2}{3}}$ $\sqrt[3]{(2y)^2} = \sqrt[3]{4y^2}$

26) Solve: $y^{\frac{2}{3}} = 64$

A) ± 512 B) ± 16 C) 16 D) 512

27) Solve: $(c-1)^{\frac{2}{3}} = 25$

A) 126 and -124
B) -124
C) 126
D) -126 and 124

28) Solve: $4x^{\frac{1}{5}} + 2 = 10$

$-2 \quad -2$

$4x^{\frac{1}{5}} = 8$

$\frac{4x^{\frac{1}{5}}}{4} = \frac{8}{4} \rightarrow x^{\frac{1}{5}\cdot\frac{5}{1}} = 2^{\frac{5}{1}} = 32$

29) Which one of the following sets is *not* a function?

A) {(1,1), (1,2), (1,3)}
B) {(1,1), (2,1), (3,1)}
C) {(1,1), (2,2), (3,3)}
D) {(1,2), (2,3), (3,4)}

X-values will not repeat in a function

20) $(-3x^2y^3)^3$

$(-3)^3(x^2)^3(y^3)^3$

$-27x^6y^9$

26) $y^{\frac{2}{3}\frac{3}{2}} = 64^{\frac{3}{2}}$

$y = \pm 512$

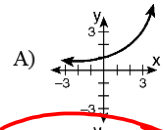
27) $(c-1)^{\frac{2}{3}\frac{3}{2}} = 25^{\frac{3}{2}}$

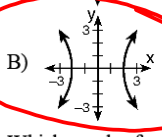
$c-1 = \pm 125$

$c-1 = +125$
$+1 \quad +1$
$c = 126$

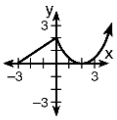
$c-1 = -125$
$+1 \quad +1$
$c = -124$

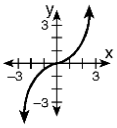
30) Which graph does *not* represent a function?

A) 

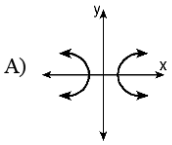
B) 

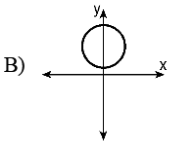
Does Not Pass VLT

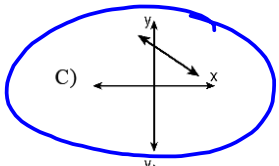
C) 

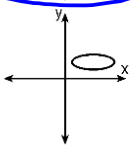
D) 

31) Which graph of a relation is also a function?

A) 

B) 

C) 

D) 

32) If $f(x) = 4x^0 + (4x)^{-1}$, what is the value of f(4)?

A) $1\frac{1}{16}$ B) $4\frac{1}{16}$ C) -12 D) 0

33) If $f(x) = |x^3 - 3|$, then f(-1) is equal to

A) 0 B) 2 C) -2 D) 4

32) $f(4) = 4(4)^0 + (4(4))^{-1}$

$= 4 + 16^{-1}$

$= 4 + \frac{1}{16}$

33) $f(x) = |x^3 - 3|$ $f(-1)$

$f(-1) = |(-1)^3 - 3|$

$= |-1 - 3|$

$= |-4| = 4$

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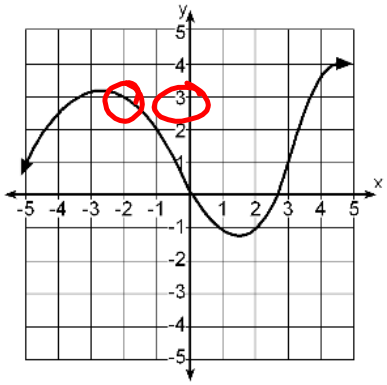
34) Given the graph below of $y = f(x)$.



According to the graph shown, what is the value of f(-2)?

A) 1 B) -1 C) 3 D) -2

35) Given the function $f(x) = 2x + 5$, find the value of $f(a + 1)$.

$f(a+1) = 2(a+1) + 5$

$= 2a + 2 + 5$

$f(a+1) = \boxed{2a + 7}$

Test